

geometry, taken a warm interest in them, and in the purely geometrical treatment of them has himself given several beautiful proofs, and has added discoveries of his own, as we have already pointed out in our notice of the last edition of his "Sequel." We may here note that this last work has met with a very warm welcome in France and Belgium. The author himself has added so much in years now long past to several branches of the subject treated of in the volume under notice—the equation of the circle (and of the conic) touching three circles (three conics), and other properties—that he is specially fitted, by his intimate acquaintance with it and by his long tuitional experience, to write a book on analytical geometry.

The divisions are into eight chapters, the first of which, in four sections, treats of the Point, three sections being taken up with Cartesian and polar co-ordinates and the transformation of co-ordinates; the fourth section gives a brief account of Complex Variables, introduced by Cauchy in 1825, and extended by Gauss: "the introduction of these variables is one of the greatest strides ever made in mathematics." The second chapter, on the Right Line, treats it (§ 1) by Cartesian, then (§ 2) by trilinear, and (§ 3) by point and line co-ordinates; this last comparison is taken from Clebsch's "Vorlesungen der Geometrie." In Chapter III. four sections are devoted to the circle, § 2 being devoted to a system of tangential circles, § 3 to the "trilinear" forms of equations to the old circles and to all the recent circles; § 4 is devoted to tangential equations. Chapters IV., V., VI., VII. treat of, respectively, the general equation of the second degree, the parabola, ellipse, and hyperbola. Chapter VIII. (miscellaneous investigations) discusses many matters of novelty and interest: § 1 is on contact of conic sections; § 2, similar figures, gives a good *résumé* of results connected with Brocard's points and circles, Neuberg's circles, M'Cay's circles, and Kiepert's hyperbola (if upon the three sides of a triangle ABC similar isosceles triangles be described, the triangle formed by their vertices is in perspective with ABC, and the *locus* of their centre of perspective is an equilateral hyperbola); in § 3, on the general equation in trilinear co-ordinates, Aronhold's notation is "now published for the first time in an English treatise on conic sections"; the remaining six sections are occupied respectively with Envelopes, Projection, Sections of a Cone, Homographic Division, Reciprocal Polars, and Invariants and Co-variants. An idea has now, we trust, been conveyed to the reader of the ground covered by Dr. Casey: a good deal of it is, of course, well-worn ground, but even this has been adorned by his touch, and much relating to the new circles has never before been introduced into our books. These circles must soon become as familiar to our junior students as the nine-point circle, whose properties are by this time nearly exhausted.

The examples are exceedingly numerous, and a good feature is that most of the results obtained in them are numbered consecutively with the important results of the text: this enables the author to refer to them with facility. They exceed 600 in number.

There are several minor typographical inaccuracies which are easily corrected, but there are besides incorrect references to back articles and pages, which cause the

reader some little annoyance in using the book: these can be easily rectified in a second edition (one on p. 150 gave us trouble, for Art. 23 read 21, p. 33).

It remains only to say that the expenses of the publication have been defrayed by the liberality of the Committee of the "Dublin University Press Series."

TWO YEARS IN THE JUNGLE

Two Years in the Jungle: the Experiences of a Hunter and Naturalist in India, Ceylon, the Malay Peninsula, and Borneo. By William T. Hornaday, Chief Taxidermist, U.S. National Museum, late Collector for Ward's Natural Science Establishment. (London: Kegan Paul, Trench, and Co., 1885.)

THE author of this somewhat ponderous volume was sent to India by "Professor" Ward, the well-known purveyor of natural history specimens at Rochester, New York, for the purpose of collecting various zoological desiderata, and especially skins and skeletons of the larger mammalia, and of crocodiles. The importance of this kind of collecting is greater than would be supposed by those who have no experience of its difficulty, and the task of securing specimens, and of preserving them so as to render them useful for scientific study, demands no inconsiderable amount of courage, perseverance, and knowledge. The majority of the skins and skeletons of the larger mammalia in European museums are derived from the specimens, generally dwarfed in stature, and very often diseased, obtained from menageries, and if these are to be replaced by the spoils of wild individuals, hunters who have a considerable knowledge of taxidermy must be engaged to collect. Many of the largest and most remarkable mammalia of the world are being rapidly exterminated, and before they share the fate of the dodo and *Rhytina* it is to be hoped that good skeletons, at all events, may be rescued for the study of future generations.

Mr. Hornaday is evidently an enthusiast in his art, and having greatly enjoyed both the sport of shooting wild animals and the process of converting elephants, tigers, orang-utans, crocodiles, and other formidable denizens of forest and swamp into useful museum specimens, he proceeds in the present work to give a full account of his wanderings and adventures during two years and nine months, the greater portion of which was spent in very wild parts of South-Eastern Asia and some of the neighbouring islands.

On the whole, and despite many shortcomings, both literary and scientific, the book is an agreeable account of an interesting journey, and scattered through the volume are many useful zoological notes. Amongst the most important of these are those referring to orang-utans, of which Mr. Hornaday obtained forty-three specimens, the majority shot by himself. He gives a series of measurements, which are particularly useful, of these and of several of the other mammalia which he obtained. He also describes the "nests," or rather resting-places, made by orangs, though the figure which he gives of one is unfortunately taken from an artificial imitation set up by him in the Museum at Washington and not from nature. The figure in question looks more like a gigantic crow's nest than the rough platform described at p. 403, and

does not agree with the description. The curious proboscis monkey, *Semnopithecus (Nasalis) larvatus*, the Bornean gibbon, and several Indian and Ceylonese monkeys also furnish occasion for interesting notes, some of which are novel.

The greater part of the work is however devoted to descriptions of shooting wild animals, such as may be found in dozens of sporting books, or to accounts of the ordinary incidents of travel, and the book is prolonged by dissertations on the habits of animals, and on specific characters. Here the author is fairly beyond his depth. Chapter XX., for instance, is occupied with an account of the habits of the Indian elephant. Nearly the whole is compiled from Sanderson and other writers, and some of the statements thus copied are of very doubtful accuracy. Thus Schlegel's view that the Ceylon elephant is the same as the Sumatran, and distinguished from that of India by the number of ribs and dorsal vertebrae—a view long since shown by Falconer to be untenable—is stated as if it were an undoubted fact. Before, however, one has read much of Mr. Hornaday's work, it is manifest that the author's zoological knowledge is superficial and imperfect. At p. 14 the limestone of which the pyramids are built is said to be "full of nummulites, little flat echinoderms;" and at p. 72 we read, "unlike all other antelopes, the female gazelle possesses horns." Of course the author meant to write, unlike all other *female* antelopes, but this does not prevent the statement being a gross error; it might have been expected that any one writing on mammalia would be acquainted with such conspicuous instances of horned female antelopes as are offered by the eland and oryx.

It may naturally be inferred that the scientific names applied to animals by Mr. Hornaday are not always correct. For instance, at p. 107 he records the shooting in the Wynaad forest, Southern India, of a specimen of *Semnopithecus leucoprymnus*, a kind of monkey peculiar to Ceylon. The animal shot was probably *S. priamus*, of which there is a fine South Indian specimen in the Agassiz Museum, Cambridge, Mass., very possibly derived from Mr. Hornaday's collection, but wrongly labelled *S. entellus*. The circumstance that the Wynaad *Semnopithecus* is wrongly identified makes it probable that the Ceylon monkeys called *S. leucoprymnus* (pp. 268 and 277) were also *S. priamus*.

One point in Mr. Hornaday's favour it is only just to notice. His account, so far as it is possible to judge, is truthful. He may err in citing authorities who are incorrect, but his own observations appear trustworthy, and he records his failures with as much spirit as his successes. The illustrations are numerous and as a rule fairly good, if not always very artistic, but some of the views, and especially that of Ootacamund, opposite p. 96, give a poor, and not a very correct idea of the scenery.

W. T. B.

OUR BOOK SHELF

Traité de Zoologie Médicale. Par Prof. R. Blanchard. Part I. (Paris: J. R. Baillière et fils, 1886.)

It is difficult to comprehend what is meant by medical zoology, but it is easy to take in the object and design of this manual. These are to give a general sketch of the structure and classification of the various forms of animal

life, and to call the attention in some detail of medical men or students to those species, which are either useful or injurious to man. It would thus aim at combining an introduction to zoology with a short treatise on animal parasites and some notes on economic zoology. We doubt if in the pages of a small volume such a treatment of this vast subject could be satisfactorily carried out, and it speaks a great deal for the knowledge and tact of Prof. R. Blanchard, that he has, so far as we can judge from this first part of his manual, succeeded in producing a most readable work, which cannot fail of being attractive to the class for whom it has been written, and the knowledge conveyed in which is fairly up to a modern point of view. The manual is destined to form a volume of about 800 pages, illustrated by some 400 figures, which, for the most part drawn from original sources, are fairly reproduced. We note that at least in one case this reference to original figures has not been without its advantages, for the figures given by Saville Kent, in his manual of the Infusoria, of *Asthmatos ciliaris*, Salisbury, not being exact, have been misleading to others who have again reproduced them, and there can be no doubt that this so-called parasite, thought to be the cause of hay catarrh, is nothing but an isolated epithelial cell of the naso-pharyngeal passages. The references to authorities seem very complete, and the second part is promised immediately with a title-page and "les tables." May we hope that these latter will include an index of the species referred to, or at least of those the life-histories of which are given in detail. This would immensely increase the usefulness of the volume.

Microscopische Reactionen. By Dr. Haushofer, Professor am Technischen Hochschule, Munchen. (Braunschweig: Vieweg und Sohn, 1885.)

THIS book will be hailed both by the ordinary chemist, and also by the geologist, and also by the pharmacist, as a most valuable addition to our already very numerous books on chemical reactions or analysis. The object of the author has been to arrange in such a form as can be used in the laboratory, tests and reactions of a great number of substances which may be performed on very minute quantities, and the resulting bodies recognised by their characteristic forms under the microscope. As the author says, some substances are so easily recognised in minute quantities even in the ordinary way, like iron, iodine, or by spectroscopic means, as thallium or lithium, that recourse to the microscope is seldom necessary. But in the majority of cases, where small quantities have to be looked for, the style and general habitus of crystal produced either in precipitates or by evaporation from solutions, and especially their behaviour towards polarised light, gives most valuable indications of the presence of any metal, and where, as in most cases can easily be done, several salts are in this way compared, the results are quite as conclusive as with large quantities. The substances treated of are metals, non-metals, and acids, which are arranged for greater convenience of reference in working, in alphabetical order. The principal and most general forms of crystals are illustrated by 137 well-executed woodcuts.

A Bibliography of Protozoa, Sponges, Cœlenterata, and Worms; including also the Polyzoa, Brachiopoda, and Tunicata, for the Years 1861-83. By D'Arcy W. Thompson, B.A., Professor of Biology, University College, Dundee. (Cambridge: The University Press, 1885.)

THE importance of the well-known "Bibliotheca Zoologica" of Engelmann, with its immense and accurately-compiled supplement by Victor Carus, to the biological student need not be insisted on, and in the present work we have this record carried out to 1883 for the large groups of the Protozoa, Sponges, Cœlenterata, and Worms, including also the Polyzoa, Brachiopoda, and Tunicata. This